Maritime Heritage Minnesota

Ann Merriman
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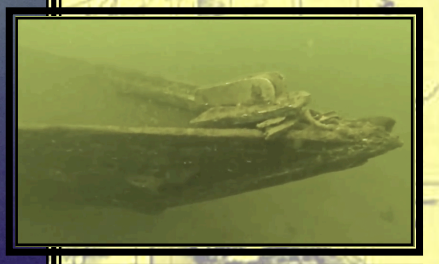
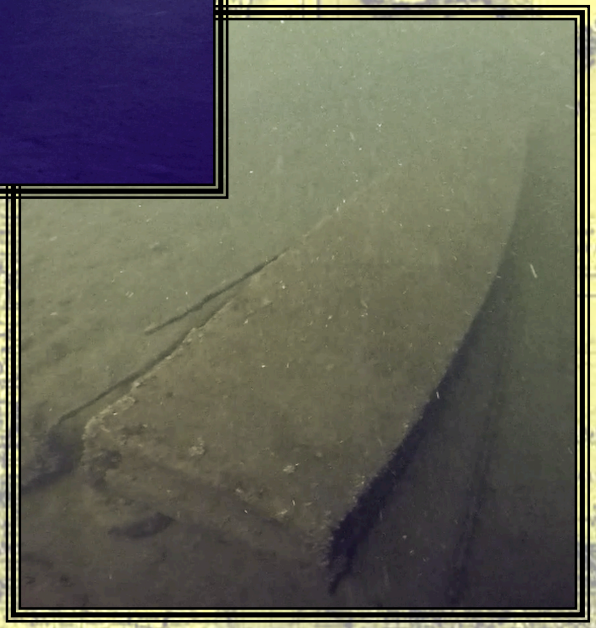
Lake Minnetonka Nautical Archaeology 5 Project Report





Acknowledgments

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Introduction

Wrecks and the artifacts associated with them tell a story. Removing or otherwise disturbing artifacts, treating them as commodities that can be sold, obliterates that story. Nautical archaeological and maritime sites are finite and are significant submerged cultural resources. Nautical, maritime, underwater, maritime terrestrial – MHM deals with all of these types of sites throughout the State of Minnesota. Maritime Heritage Minnesota's (MHM) mission is to document, conserve, preserve, and when necessary, excavate these finite cultural resources where the welfare of the artifact is paramount. MHM is concerned with protecting our underwater and maritime sites – our shared Maritime History – for their own benefit in order for all Minnesotans to gain the knowledge that can be obtained through their study. MHM's study of wrecks does not include the removal of artifacts or damaging the sites in any way. MHM does not raise wrecks or 'hunt' for 'treasure'. Submerged archaeological sites in Minnesota are subject to the same State statues as terrestrial sites: the Minnesota Field Archaeology Act (1963), Minnesota Historic Sites Act (1965), the Minnesota Historic District Act (1971), and the Minnesota Private Cemeteries Act (1976) if human remains are associated with a submerged site. Further, the case of *State v. Bollenbach* (1954) and the Federal Abandoned Shipwrecks Act of 1987 provide additional jurisdictional considerations when determining State oversight and "ownership" of resources defined by law as archaeological sites (Marken, Ollendorf, Nunnally, and Anfinson 1997, 3-4). Therefore, just like terrestrial archaeologists working for the State or with contract firms, underwater archaeologists are required to have the necessary education, appropriate credentials, and hold valid licenses from the Office of the State Archaeologist (OSA).

MHM completed two side and down-imaging sonar surveys of Lake Minnetonka in September-November 2011 and May-June 2012 – the Lake Minnetonka Surveys 1 and 2 Projects (LMS-1, LMS-2). Prior to MHM's two comprehensive surveys, there was one recognized nautical archaeological site on the lake bottom and another five wrecks were known. MHM completed the Lake Minnetonka Nautical Archaeology 1-4 Projects (LMNA-1, LMNA-2, LMNA-3, LMNA-4) between 2012-2015. At the beginning of the Lake Minnetonka Nautical Archeology 5 Project (LMNA-5) in early September 2015, there were 43 known wrecks (including the Lake Minnetonka North Arm Dugout Canoe removed from the lake in 1934), 18 maritime sites/cultural resources, and 10 'other' objects identified on the bottom of Lake Minnetonka.

Preface

During the Lake Minnetonka Nautical Archaeology 5 Project (LMNA-5), MHM investigated 31 unknown anomalies. The fieldwork was conducted from early September to mid-October 2015.

Results of the Lake Minnetonka Nautical Archaeology 5 Project

Research Design

The purpose of the LMNA-5 Project was to determine the nature of specific anomalies to answer questions about their nature and to continue MHM's sediment build-up study. MHM determined which anomalies would be investigated from an analysis of sonar data that suggested they were submerged cultural resources. Each anomaly was assigned a number upon its recognition as a possible site. The 31 anomalies examined during the LMNA-5 Project were numbers 7, 9, 23, 40, 78.1, 97, 199, 327, 337, 351, 403, 441, 448, 452, 457, 481, 487, 488, 489, 491, 494, 548, 549, 550, 552, 558/559, 563, 564, 565, 566, and 569. Using data accumulated from the fieldwork as a starting point, MHM conducted research to place newly recognized nautical archaeological sites and anomalies in their historical contexts. Minnesota Archaeological Site Forms were filed with the OSA when appropriate.

Methodology

The methodology used to identify and rudimentarily document underwater archaeological anomalies is straightforward. MHM used the GPS coordinates of an anomaly to drop a weighted diver down buoy near the target. The dive boat anchored a short distance away from the buoy and divers geared up for the dive. At any given time, there were between two and four divers underwater. If the buoy anchor weight landed near and sometimes on the anomaly or wreck, no search for the target was conducted. However, for a variety of reasons, a brief search for the target was conducted until it was located or it was determined that the anomaly was a false sonar return. If a cultural or natural resource was located, the divers photographed and recorded video of the site or object, recorded its basic measurements, examined any obvious attributes, and measured sediment build-up (if appropriate).

Results

After the completion of the LMNA-5 Project fieldwork in October 2015, there are now 48 identified wrecks on the bottom of Lake Minnetonka or that were once on the bottom, including a Woodland Culture dugout canoe removed from the lake in 1934. Of these wrecks, 29 of them have 28 Minnesota archaeological site numbers; 2 wrecks are features of one site. The precise sinking dates or the year of disposition of 15 of the 19 remaining wrecks are known; MHM will fill out site forms for them when appropriate. Further, 3 other types of maritime sites have archaeological site numbers and there are 15 maritime sites or objects without numbers. Additionally, 13 'other' objects have been

identified that do not have site numbers. During the LMNA-5 Project specifically – of the 31 anomalies investigated – MHM and its volunteers confirmed the existence of 5 new wrecks, 3 new submerged maritime sites, 1 new section of an existing site, 1 large cut tree stump, 4 trees (2 cut and 2 natural), 7 rocks, 2 large clumps of weeds at unexpected water depths, and 8 false sonar returns comprised of unusual bottom contours.

Wooden Sloop Wreck (21-HE-486)

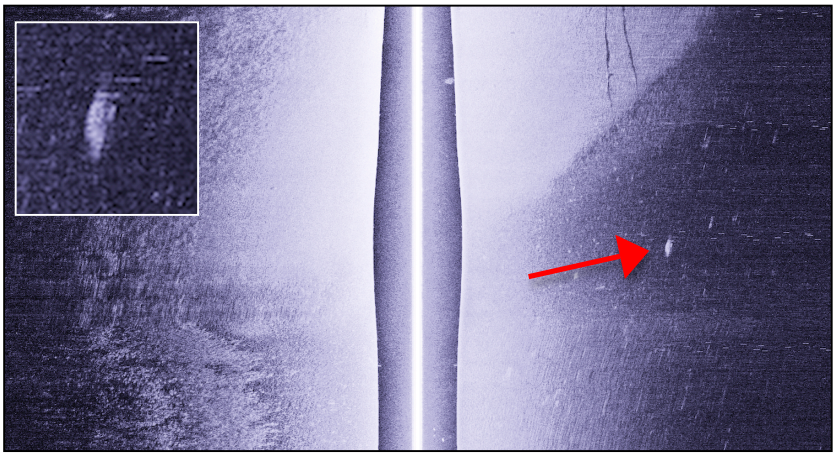
MHM recorded a sonar image during the LMS-1 Survey in 2011 and it was labeled as Anomaly 488. The Wooden Sloop Wreck may have been constructed by the Moore Boat Works of Wayzata, the major producer of wooden sailboats in the late 1800s on the lake. A sailboat appears in Moore's 1908 catalog, advertised as an augmented family rowboat, but this vessel is depicted with a Bermuda sail instead of the required gaff sail. A sloop is defined as a single-masted sailing vessel, carrying one gaff (trapezoidal) sail and fitted with a bowsprit and optional jib. MHM is confident the Wooden Sloop Wreck is a sloop based on the mast placement. MHM considered the possibility that the wreck could be a catboat, but the mast of a catboat is placed just behind the stempost as far forward as possible. The Wooden Sloop Wreck is the first sailboat wreck identified on the bottom of Lake Minnetonka.

The Wooden Sloop Wreck is 17.70 feet long, 3.90 feet wide, and when new, would have had a maximum 1.50-foot depth of hold. The wreck is deteriorated and lies in about 34 feet of water. Most of the wreck is buried by silt, with certain attributes visible. The stempost rises from the silty lake bottom with two rabbets on either side that contain remnants of the bow strakes, but the gunwales have not survived anywhere along the hull. The stempost has a hole drilled through it to accept a line, either for towing, rigging, or both. A stanchion located aft of the stempost is the stump of the mast. The stern has a wineglass design and the transom survives, with the rudder post attached on the outside of the hull. The surviving strakes, felt under the light silt, indicate a clinker-built/lapstrake design. The outline of the wreck both port and starboard, formed by loose hull strakes, can be seen; this outline, along with the stempost, mast stump, and wineglass stern transom allowed the side-imaging sonar to differentiate the wreck from the surrounding bottom matrix. The bottom of the hull survives but is buried, with frames protruding through the silt at various points. The two most significant attributes that define the Wooden Sloop Wreck site are the rudder post (indicating the wreck is a sailboat) and the mast placement.

The Wooden Sloop Wreck is lightly built like other known small wrecks on the lake bottom, in particular the Wayzata Bay Rowboat Wreck (21-HE-417), the Gideon Bay Wreck (21-HE-415), and the St. Louis Bay Wreck (21-HE-422).[1] These 3 wrecks are rowboats - no rudder posts were incorporated into their construction nor did they carry masts - and they are also of lapstrake construction. This type of light construction is due to the main function of the wreck as a sailboat for fast transportation, possibly even

[1]See MHM's *Lake Minnetonka Nautical Archaeology 1 Project Report* and *Lake Minnetonka Nautical Archaeology 2 Project Report* for more information.

early racing. Whether the boat sank accidentally or was scuttled cannot be determined. The boat was likely constructed in the 1880-1890s and since the average lifespan of a small wooden boat was not extremely long, a site disposition date of 1890-1900 is reasonable, particularly since the wreck is nearly completely buried. Water moves through Wayzata Bay rather quickly; in the northeast corner of the bay where the Wooden Sloop Wreck lies, however, it doesn't move as quickly compared to the southeast corner where the Fisherman's Friend Wreck (21-HE-485, see below) lies. This water movement explains the lack of sediment build-up on the Fisherman's Friend Wreck compared to the Wooden Sloop Wreck, while being located at the same side of the bay. Ten inches of sediment lies in the surviving hold of the Wooden Sloop Wreck, a measurement taken as part of MHM's on-going sediment build-up study in Lake Minnetonka. MHM submitted an archaeological site form for the Wooden Sloop Wreck to the OSA in December 2015 and received her site number at that time.

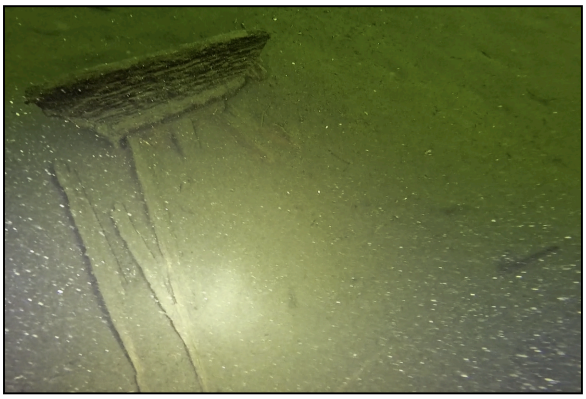


MHM's sonar image of the Wooden Sloop Wreck (21-HE-486). The wreck is almost completely buried, but the sonar picked up the shape of the wreck regardless. The inset is an enlargement of the wreck's acoustical signature.

Note the two parallel lines at the top right of the image; these lines are sections of communication cables laid on the bottom of Lake Minnetonka.

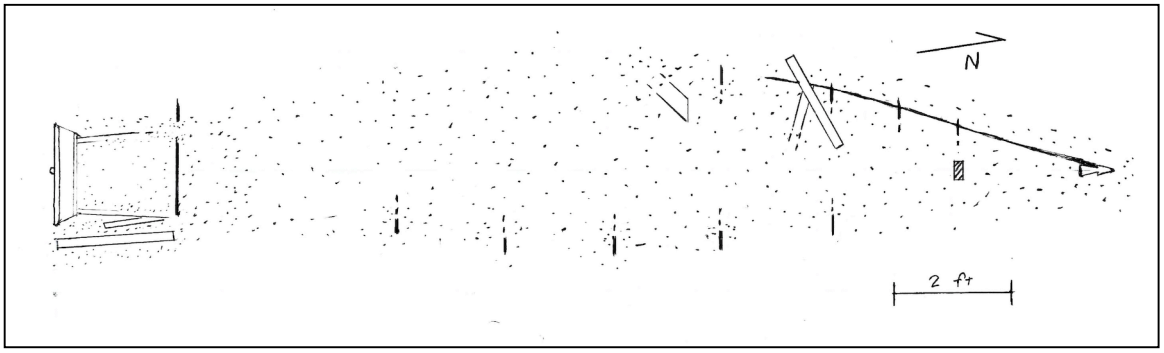
Looking toward the bow of the Wooden Sloop Wreck from the starboard side. The pieces of wood protruding from the lake bottom are the wreck's frames. The gunwale has not survived (Kelly Nehowig).

Looking toward the stern of the Wooden Sloop Wreck from the bow. The large stanchion protruding from the lake bottom at the bottom of the image is the stempost. The other stanchion near the top of the image is the stump of the mast (Mark Slick).



The inner transom and outer hull planks of the starboard side of the wreck that have collapsed outward (Mark Slick).

The out transom and the rudder post. This attribute, along with the mast stump, confirm the Wooden Sloop Wreck is a sailboat (Mark Slick).



A sketch of the Wooden Sloop Wreck (21-HE-486), nearly buried in silt (Christopher Olson).

A clinke-built wooden sloop constructed by Moore Boat Works of Wayzata (courtesy of the late Kerm Stake, a friend of MHM).

Fisherman's Friend Wreck (21-HE-485)

During the Lake Minnetonka Survey 1 in 2011, MHM recorded a sonar image of the Fisherman's Friend Wreck and it was labeled Anomaly 565. The Fisherman's Friend Wreck derives its name from the model of small rowboat produced by the Ramaley Boat Company in 1913 or later at its Wayzata location (Ramaley purchased Moore Boat Works in 1912 and began production after that boating season). MHM supposes Ramaley did not construct the wreck because it is a smaller model than they offered and is also of an earlier date. Moore Boat Works may have constructed the boat, although Moore did not offer this model in their 1908 or 1912 catalogs. Another possible manufacturer of the boat was Wise Boat Works of Wayzata but unfortunately, no catalogs are known to survive for comparison. MHM hypothesizes the boat may have been constructed by an individual, not a boat building company, because of its smaller size, and because of a known comparable 6-foot long boat pulled from the lake decades ago buy a local looter. The Minnesota Transportation Museum took custody of boat;[2] she was a smaller version of the Fisherman's Friend. This design is simple and the boat could have been built by amateur boat-builders.

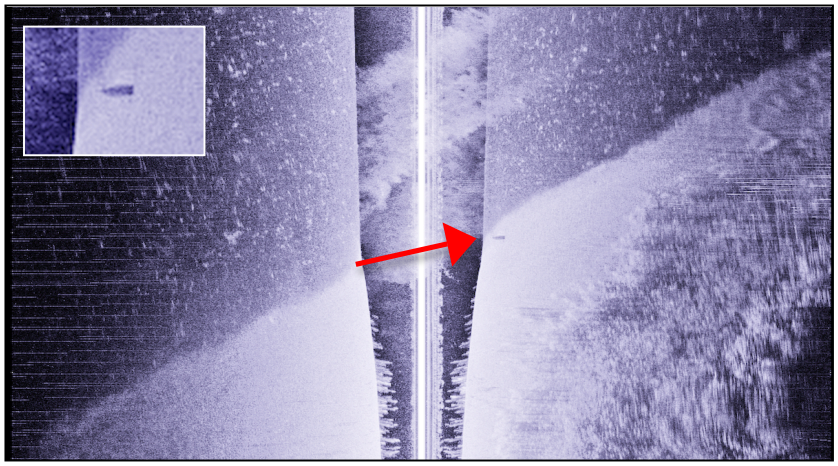
The Fisherman's Friend Wreck is 12.80 feet long, 2.80 feet wide, with a 1.40-foot depth of hold, and lies in about 31 feet of water. The boat was constructed with slot-headed wood screws, one indicator of age, and is partially covered with zebra mussels. The wreck is capsized and lying with its flat athwartships-planked bottom exposed, a diagnostic attribute for the Fisherman's Friend design; the boat is lying on medium-sized rocks and next to a field of small and medium-sized rocks. The bow is sharply pointed and the stern has a square transom design. The wreck is constructed of three strakes (a strake is a row of a hull's side planks) on each side with a rubrail attached to the top-most strake on port, starboard, and the square transom as well. The port side rubrail has detached from the wreck amidships and aft, while the starboard side rubrail and top-most strake have detached amidships, and at the stern these planks are disintegrated, creating a rectangular hole. Through this hole, 2 planks can be seen that had been attached to the inner hull and served as the stern-most seat for the boat; these planks are lying on a rock and the lake bottom. Red paint survives on the port side top-most strake, nearly the length of the wreck, while the second strake has surviving paint evident on the port stern quarter. The wreck is heavily built when compared to other known small wrecks on the lake bottom, in particular the Wayzata Bay Rowboat Wreck (21-HE-417), the Gideon Bay Wreck (21-HE-415), and the St. Louis Bay Wreck (21-HE-422).[3] These 3 rowboats are more lightly built - meaning their wood is thinner - than the Fisherman's Friend Wreck. This trait is due to the main function of the Fisherman's Friend Wreck as a plain no-frills fishing boat - and as MHM suggests - a work boat. The other 3 small wrecks were constructed for easy rowing and comfort for pleasure boating or tourist fishing and were more lightly built as a result. MHM surmises the Fisherman's Friend Wreck was also used to haul waste or unwanted materials, such as rocks, from the shoreline as indicated by the field of small and

[2]The small boat was offered to the Minnesota Historical Society but declined to take custody.

[3]See MHM's *Lake Minnetonka Nautical Archaeology 1 Project Report* and *Lake Minnetonka Nautical Archaeology 2 Project Report* for more information.

medium stone dumped near the wreck site. MHM suggests the boat sank in the area where it functioned as a work boat after it suffered the starboard stern quarter damage. Whether the boat sank accidentally or was scuttled cannot be determined.

The boat was likely constructed in the 1890s and since the average lifespan of a small wooden boat was not extremely long, a site disposition date of 1900-1910 is reasonable. The relative health of the wreck's thick wood is good but it is worn, possibly by water erosion. The lack of silt build-up on and around the wreck indicates the water in this section of Wayzata Bay is moving quickly toward the Grays Bay outlet. MHM submitted an archaeological site form for the Fisherman's Friend Wreck to the OSA in December 2015 and received her site number at that time.



MHM's sonar image of the Fisherman's Friend Wreck (21-HE-485).

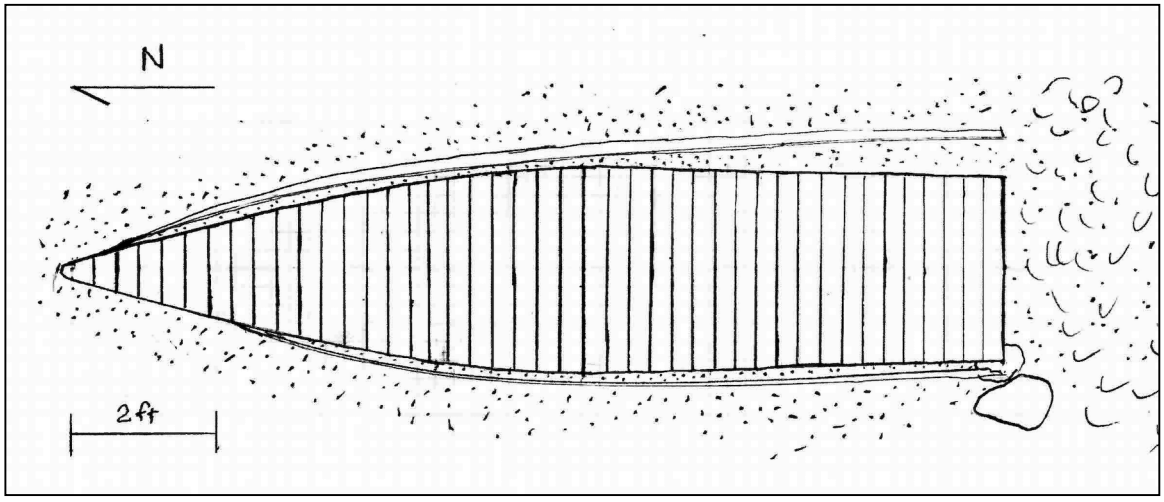
The inset is an enlargement of the wreck's acoustical signature.

Views of the capsized Fisherman's Friend Wreck from the stern and the bow (Mark Slick).

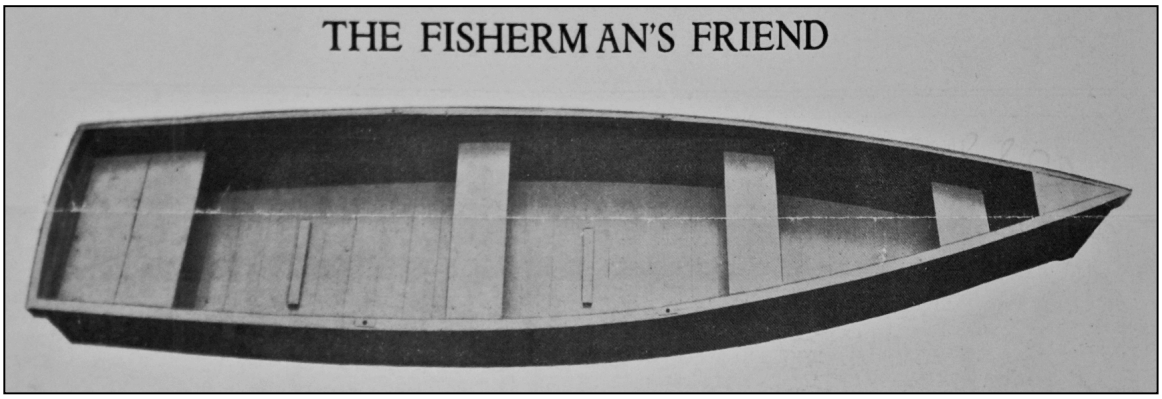
The transom stern of the wreck with a rubrail.

Damage on the starboard stern quarter. The two planks on the lake bottom were attached to the inner hull and served as a stern seat.

Red paint survives on the port stern quarter. (Mark Slick)



A sketch of the Fisherman's Friend Wreck (21-HE-485) that sank and capsized near a field of stones (Christopher Olson).



The Fisherman's Friend offered by Ramaley Boat Company (Ramaley Brochure, ca. 1913).

Maxwell Bay Rowboat Wreck 2 (Anomaly 78.1)

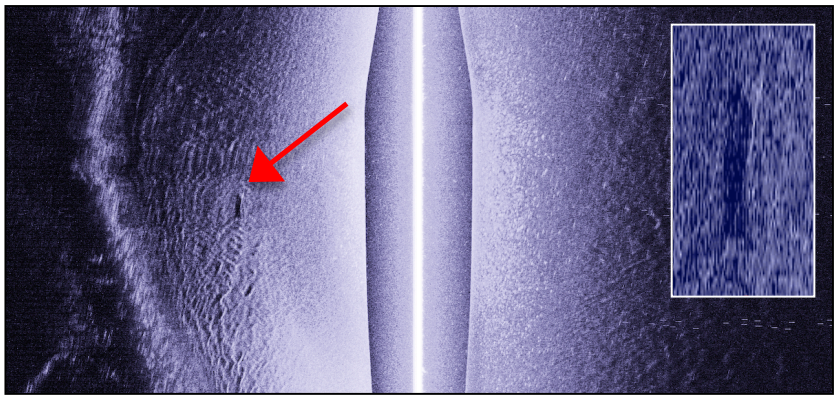
MHM recorded a sonar image of the Maxwell Bay Rowboat Wreck 2 (Anomaly 78.1) during the Lake Minnetonka Survey 2 Project in May 2012. The wreck is site is 14.00 feet long and 2.50 feet wide, with hull planks that measure 3.25 inches wide. There is 3.50 inches of sediment built-up in the hull. The sharply-pointed and steeply-raked bow is unique when compared to the other 8 small Lake Minnetonka wooden wrecks identified to date: Wooden Sloop Wreck (21-HE-486), Wayzata Bay Rowboat Wreck (21-HE-417), St. Louis Bay Wreck (21-HE-422), Gideon Bay Wreck (21-HE-415), Crystal Bay Rowboat Wreck (21-HE-457), Maxwell Bay Rowboat Wreck (21-HE-469), Wooden Motor Boat Wreck (21-HE-467),[4] and the Fisherman's Friend Wreck (21-HE-486). These other wrecks have plumb (vertical) or nearly plumb bow rakes while the construction and design of the Maxwell Bay Rowboat Wreck 2's bow is exceedingly different. The hull is carvel-built and sturdy, with thick plank widths, indicating the boat was heavily built. From the bow to stern, the hull narrows only slightly to the square transom. The flat bottom is athwartships planked, the second wreck with this attribute identified on the lake bottom, along with the Fisherman's Friend Wreck.

The tip of the stempost of the sharply pointed bow is damaged and it has a metal ring with an anchor thimble attached. Behind the loop and thimble, an anchor roller with a trapezoidal base plate is loose, but it was once attached between the forward gunwales. Two thin stringers are attached to the upper most strakes on both port and starboard; these beams add forward strength and served as an attachment point for triangular decking that is no longer extant. Amidships, longitudinal two-by-four stringers are attached to the inner hull as supports for a thwart seat that lies loose inside the hull. Thinner stringers are attached to the port and starboard stern quarters inside the hull, on the upper and lower strakes, along with vertical corner braces; again, the upper stringers are supports for a missing thwart seat. Between the amidships and stern seat stringers on port and starboard, two futtocks are attached to the inner hull for support. These futtocks are not true frames since they do not extend across the bottom of the

[4]See MHM's *Lake Minnetonka Nautical Archaeology 1 Project Report*, *Lake Minnetonka Nautical Archaeology 2 Project Report*, and *Lake Minnetonka Nautical Archaeology 4 Project Report* for more information.

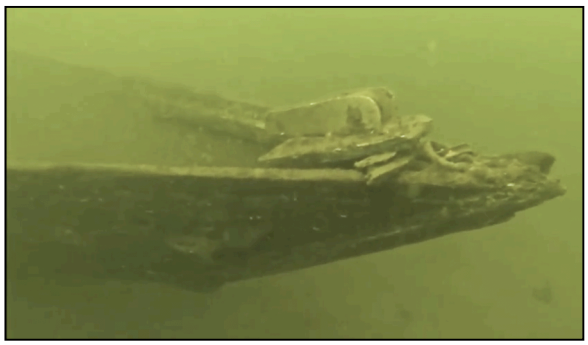
hull in the form of floors, but they serve the same purpose as traditional frames. It appears that the hull had layers of paint or primer; bits of light blue paint with a white undercoating are seen on the forward sections of the wreck toward bow.

The most interesting attribute of the Maxwell Bay Rowboat Wreck 2 is the bow's steeply raked design and the composite stempost. The stempost is comprised of two beams, one trapezoidal in cross-section and the other triangular. The trapezoidal piece is set behind the triangular piece and the wreck's strakes are rabbeted into the stempost. Below the stempost, a small bow rub strake is attached to the outer hull. These attributes - the steep rake, composite stempost, and the rub strake - that are put together to form the bow of this small wooden rowboat, combine to make the Maxwell Bay Rowboat Wreck 2 a unique example in the underwater archaeological record of not only Lake Minnetonka, but Minnesota. Beyond their rarity, this combination of attributes are indicators how the boat was operated during it s working life; they suggest the Maxwell Bay Rowboat Wreck 2 often landed on shoreline that required a high reinforced bow to absorb the shock of hitting rocks or being dragged along hard ground. The wood of the hull and the main metal components are in exceptional condition. MHM is confident this wreck meets the criteria to be an underwater archaeological site in Minnesota, but some questions remain about specific details of the wreck's construction. MHM will not seek a site designation at this time and further documentation is planned in the near future.



MHM's sonar image of the Maxwell Bay Rowboat Wreck 2 (Anomaly 78.1).

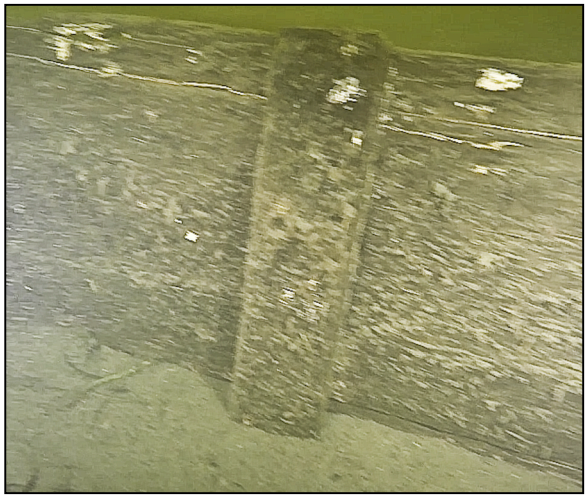
The inset is an enlargement of the wreck's acoustical signature.



The bow and stern of the Maxwell Bay Rowboat Wreck 2 (Kelly Nehowig).

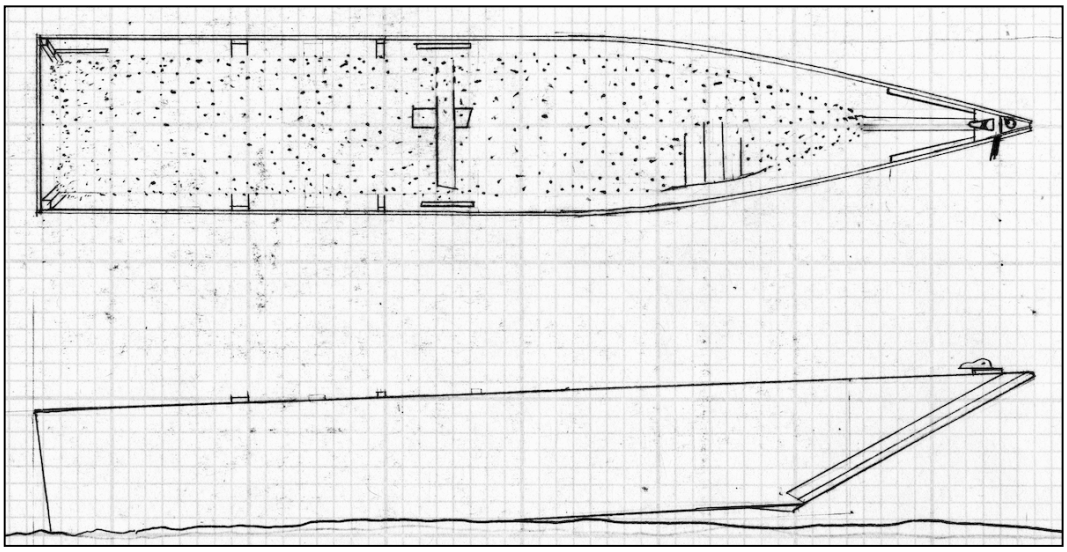
The bow rub strake (Mark Slick).

Blue paint with a white undercoating on the port bow (Mark Slick).



The inner port side hull of the wreck showing a futtock (Mark Slick).

The athwartships bottom planking is clearly seen in this section of cleared bottom hull (Mark Slick).



A sketch of the Maxwell Bay Rowboat Wreck 2 (Christopher Olson).

This MInnesota scene of hunters with the birds they shot is valuable to MHM since it shows their boat's bow is similar to Anomaly 78.1. Aditionally, it depicts the activity MHM theorizes the Maxwell Bay Rowboat Wreck 2 would have engaged in often - landing on the lakeshore. While the bow of this boat is similar to Anomaly 78.1, the stern is completely different. This photo was taken around 1900 (MNHS GV3.31.p179, digitized by MHM).

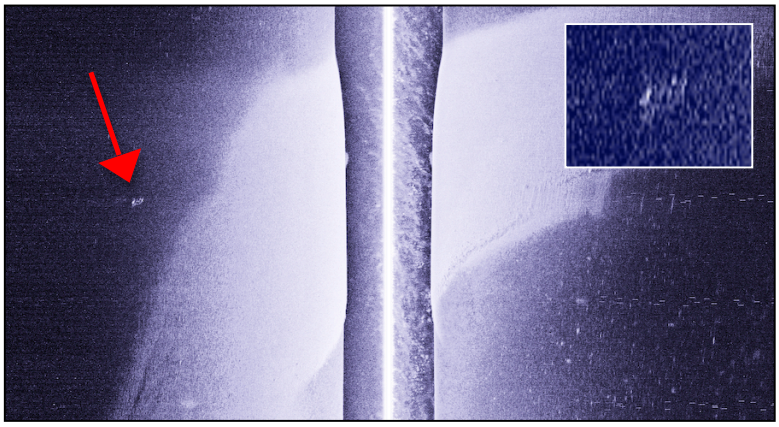
A Minnesota boat that resembles the Maxwell Bay Rowboat Wreck 2, although it is much larger. This photo was taken around 1910 (MNHS GV3.61r45, digitized by MHM).

A small Minnesota boat that resembles the Maxwell Bay Rowboat Wreck 2. Note the people in are paddling the boat, not rowing. This photo was taken prior to 1915 (MNHS GV3.61r31, digitized by MHM).

Doug Out Utility Wreck (Anomaly 403)

MHM recorded a sonar image of the *Doug Out* Utility Wreck (Anomaly 403) during the LMS-1 Project in November 2011. The name of the wreck is derived from her actual name - *Doug Out* - was seen on the stern once silt was cleared away from the hull, under what appears to be an exhaust port. The wreck is 16.00 feet long and 5.50 feet in the beam. She has a fiberglass hull that is formed to resemble a clinker-built wooden boat. The faux-lapstrake design of *Doug Out* is not profound, but it is easily seen on the outer hull and the designer's intention to imitate a wooden boat is obvious. The wreck's forward deck, gunwales, and inner hull are outfitted in wood. The deck is probably mahogany, while the other wooden components may be a combination of mahogany and plywood laminates. Foredeck components include a Nautalloy navigation light with a pennant mast (Andy Mueller, personal communication, 10 December 2015) that has fallen over, towing loop, lifting eye, two chocks, an Iva-Lite spotlight, and the windshield is intact. On the port side amidships, an air vent cowl survives, although it is loose over the hole that allowed air into the bilge; a corresponding starboard hole is seen, but the cowl is missing and may be lying under the silt alongside the wreck or buried inside the hull. On the port and starboard side stern quarters, another set of chocks are attached to the gunwale. At the stern, the afterdeck is outfitted with a gas tank cap, stern lifting eye, and a short light mast that is still up, indicating the boat may have been traveling in the dark when she sank. A water ski pull is attached to the wreck. It lies on the afterdeck wrapped around the lifting eye, and it terminates at the buoyant ski handles, suspended in the water column at the port stern quarter. A thinner line runs from the stern lifting eye through the port side stern chock and into the hull. A splashrail extends from the bow on port and starboard at least 3/4 of the way down the hull, and possibly the entire wreck. A splashrail that extends the full length of a hull is most commonly found on aluminum boats, not fiberglass examples.

The wreck has an intact dashboard with the appropriate gauges set in a backing plate. To the port side of the gauges, the Iva-Lite controller extends from the dash and next to that, a rectangular black and white skull and crossbones icon was unexpectedly found. The red steering wheel has white details and a throttle lever, possibly made redundant by the side-mounted Morse controller located on the starboard side inner hull. The cockpit is created by a high-backed bench seat for the operator and a passenger. Just behind the bench, the 8 cylinder inboard engine is visible because the doghouse cover detached and flipped backward during the wrecking process, landing against the transom. Vent holes are seen in the sides of the doghouse. The wreck has no registration number, indicating she sank prior to July 1, 1959. However, one attribute found on the wreck indicate she may have actually sank during the early summer of 1959; the Nautalloy navigation lights and pennant mast were designed by Tom Faul for Harwood Shepard's business, the Aluminum Manufacturing Company "about 1959" according to Shepard's son and contemporary literature (Andy Mueller, personal communication, 10 December 2015; Mtngentleman 2010). MHM has many questions to answer about Anomaly 403, including her year of manufacture and her brand. It is hoped that funding can be secured in the immediate future in order to return to the wreck for more data collection.

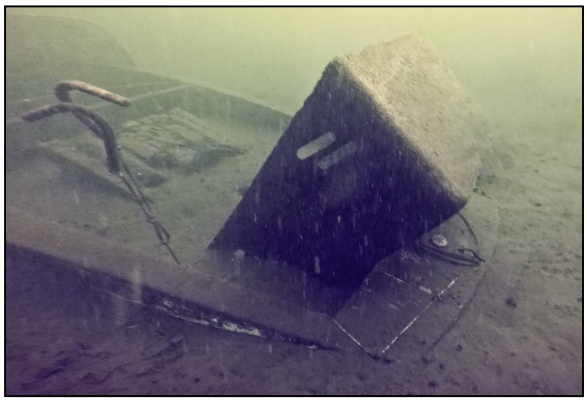


MHM's sonar image of the *Doug Out* Utility Wreck (Anomaly 403).

The inset is an enlargement of the wreck's acoustical signature. The sonar image does not closely resemble a watercraft, but *Doug Out* stands out when compared to the surrounding matrix.

Doug Out, looking from the port bow. The deck fittings, including the fallen Nautalloy navigation lights and pennant mast, Iva-Lite spotlight, windshield, faux lapstrake fiberglass hull, and splashrail are clearly seen (Mark Slick).

The port side of the wreck showing the splashrail, engine, and the doghouse flipped open (Kelly Nehowig).



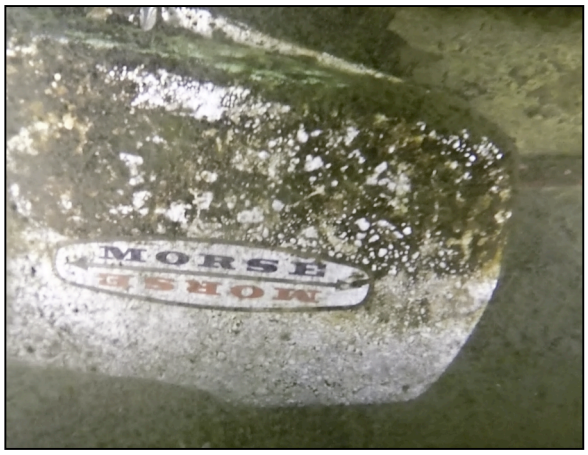
Viewing the wreck from the port quarter stern, the ski pull handles are seen in the water column. The gas cap is seen on the after deck under the doghouse along with more of the ski pull (Mark Slick).

The starboard side looking toward the cockpit, dashboard, and windshield (Kelly Nehowig).

The starboard forward quarter showing the faux lapstrake hull and deck fittings. The lack of a registration number means *Doug Out* sank prior to July 1, 1959 (Kelly Nehowig).

The dashboard of the wreck with gauges to the right, then the Iva-Lite knob, and then the skull and crossbones icon (Mark Slick).

The red steering wheel attached to the dashboard and the throttle controller on the starboard side (Mark Slick).

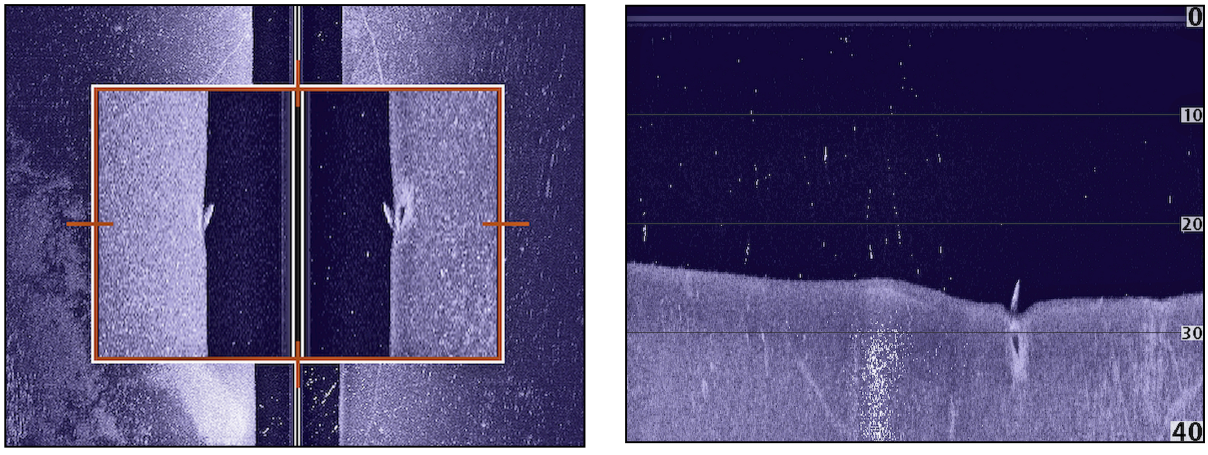


The Morse brand throttle controller (Mark Slick).

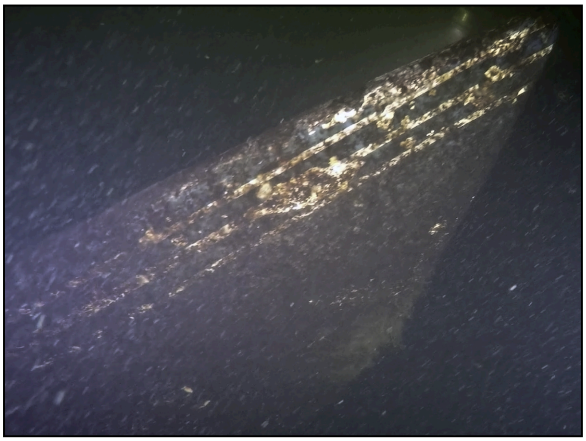
With some of the silt cleared away from the stern, the name *DOUG OUT* is visible and made of raised black letters (Mark Slick).

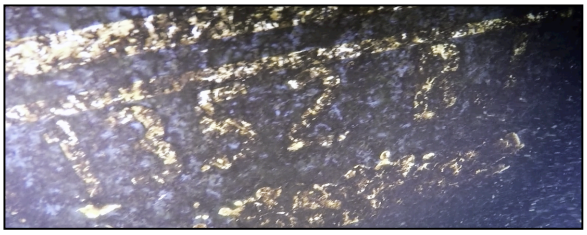
Fiberglass Drag Boat Wreck (Anomaly 23)

MHM recorded a sonar image of the Fiberglass Drag Boat Wreck, Anomaly 23, during the LMS-1 Project in November 2011, and identified the site in early September 2015. The sonar signature of the wreck suggested an object suspended in the water column; the bow of the wreck is sitting off the lake bottom. The wreck is 16.40 feet long with a 6.40-foot beam and is made of painted fiberglass. Her registration number is MN 1352 BJ, a number assigned by the State of Minnesota in 1963 (*Deephaven Argus* 1964). Her hull is bright blue with 3 white stripes below the gunwale, the bottom paint is mostly missing, and the foredeck is white. There is a ragged hole in the foredeck and the fiberglass on the bottom of the forward hull is ragged, with loose strands evident. There is a noticeable caprail of sorts formed from the fiberglass deck. Any extant gauges on the dashboard cannot be discerned because of silt and the steering wheel is missing. The deck area above the dashboard is elevated when compared to the section toward the bow. The after half of the wreck is buried in silt but manual probing was used to determine that the wreck's single cockpit is missing its the bench seat, and the bulwark in front of the V-8 engine is missing. The engine is large and is set at the stern near the transom, with no afterdeck evident. MHM could not determine the manufacturer of the wreck due to the buried nature of the wreck and poor visibility. However, from bow and cockpit attributes that could be documented, it was determined that the wreck is a racing boat and more precisely, a drag boat. It appears that the boat was constructed between 1960-1963, and the Fiberglass Drag Boat Wreck resembles a Stevens brand boat constructed in Gardena, CA. However, since MHM cannot get a good look at the wreck because of site conditions, the manufacturer remains in question. As for a site disposition date, it is known that the wreck sank prior to 1972 since her registration number does not appear in official records that have survived (John Nordby, personal communication, September 15, 2015). MHM contends the boat sank in 1963-1964 because of the lack of a year validation sticker that was required beginning in 1962 for registrations that would lapse at the end of 1964.

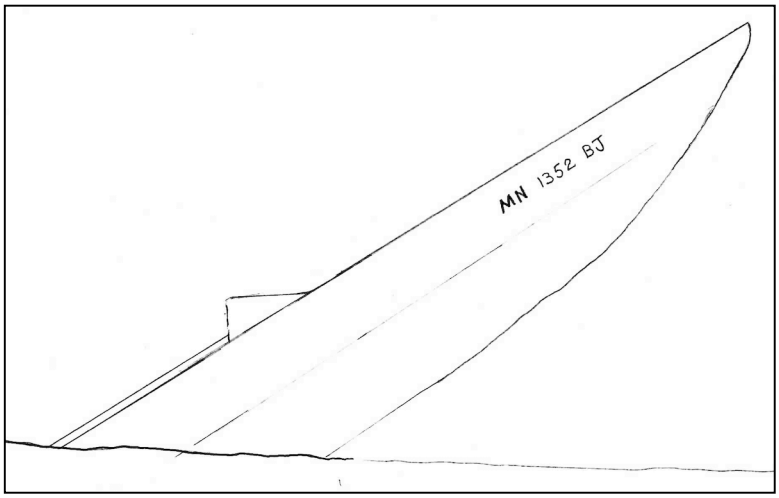


MHM's side and down sonar images of Anomaly 23.





The visibility at the Fiberglass Drag Boat Wreck Site is low. With strong lights the forward hull can be seen and the registration number read: MN 1352 BJ (Mark Slick).

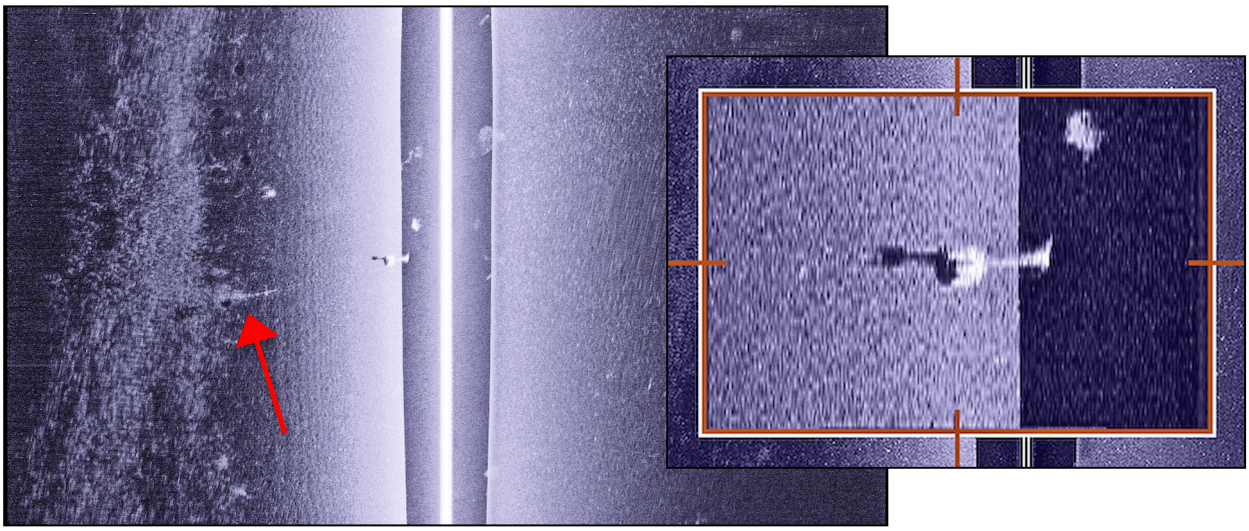


A detailed sketch is not possible at this time because of the bad visibility on the wreck site. This sketch approximates the position of the Fiberglass Drag Boat Wreck on the lake bottom (Christopher Olson).

Water Intake Pipe and Wooden Crib Site (Anomaly 9)

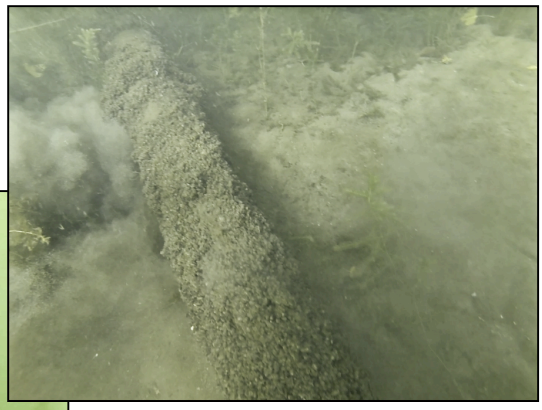
MHM recorded a sonar image of Anomaly 9 in November 2011 during the LMS-1 Project in November 2011 and dove on the site in early mid-September 2015. The site is a metal pipe shaped like a tall 'T' and anchored to the lake bottom by a stone-filled wooden crib. The pipe stands 15 feet in the water column, each mouth of the 'T' is 2.00 feet in diameter, and the wooden crib measures 5.00 feet by 10.00 feet. MHM's Olson determined the pipe is a water intake. It was extrapolated, then, that a pipe must extend into the lakebed under the crib and toward shore. MHM's sonar footage was reviewed and the acoustical signature of the pipe was found protruding from the bottom silt and disappearing into the shallows near the shore. MHM then dove on the exposed pipe in mid-October 2015. The 8-inch diameter pipe appears out of the silt about 66 feet southeast from the crib and is visible for about 64 feet, disappearing into the lake bottom at the weed line. MHM suggests the water intake, as part of Lake Minnetonka's maritime infrastructure, supplied water to the Minnetonka Beach water tower when it was constructed in the 1920s (Heidi Honey, personal communication, 22 December 2015). The intake pipe and crib, along with the pipe along the lake bottom, are directly in line with the water tower. Anomaly 9 is covered in zebra mussels, the metal pipe more profusely covered than the wooden crib and stones. The Water Intake Pipe and

Wooden Crib Site was an important link in the public utilities chain as greater amounts of infrastructure was required to sustain a growing and permanent population on Lake Minnetonka beginning in the 1920s.



MHM's sonar image of Anomaly 9. The research boat passed nearly over the Water Intake Pipe and Wooden Crib as indicated by the insert. The acoustical shadow of the upright pipe is clearly seen in the insert. The pipe extending out of the bottom of the Wooden Crib is indicated by the arrow, showing where the pipe emerges from the lake bottom silt and disappearing into the shallow weedline.

The Water Intake Pipe with the T at its top rises about 15 feet into the water column. The size of the T can be seen compared to MHM's Olson (Mark Slick).



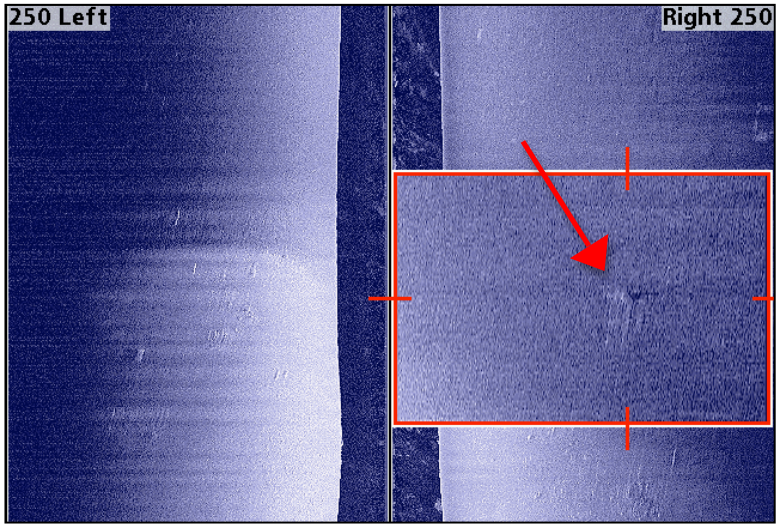
Above: The Intake Pipe lying on the lake bottom where it disappears into the weedline in shallow water (Kelly Nehowig).

Below: The Wooden Crib, weighed down with stones, that holds the Water Intake Pipe in the water column (Kelly Nehowig).

MHM plotted the coordinates of the Water Intake Pipe and Crib Site (red square) and the locations where the pipe appears out of the silt and goes back into the silt (red circles) in Crystal Bay. The red line connects the crib to the Minnetonka Beach Water Tower and lines up the water Intake, the pipe, and the tower (aerail photo from Google Earth). Insert: Minnetonka Beach Water Tower (MHM).

Update: Submerged Rubble Pile (Anomaly 351): Big Island Steamboat Pier, Park, and Veterans Camp Site (21-HE-402)

In September 2011, MHM recorded a sonar image of an irregularly shaped object off of the southeast corner of Big Island and it was labeled Anomaly 351. In mid-October 2015, Anomaly 351 was identified as a rubble pile, primarily comprised of hollow tile bricks reinforced with broken bricks and concrete. Some large pieces of wall are evident among single bricks or lumps comprised of a few bricks. Various bits of metal are located in the pile, along with a valve mechanism that is sitting up in the water column. The pile measures approximately 12 feet by 12 feet by 4 feet high. The type of bricks in the pile clearly indicates they were part of the buildings constructed for the Big Island Amusement Park in 1905-1906 by the Twin City Rapid Transit Company. The development of the park included the construction of Spanish Mission-style buildings, including a water tower, commissary, women's and men's dormitories, toilets, music hall, staff kitchen, pump house, ice house, boat house, and picnic kitchens. Many of these buildings had tile bricks reinforced with concrete as their foundations or their walls. The park opened on August 5, 1906. Ultimately, the Park was unprofitable, and it closed in late August 1911. The buildings and rides were mostly dismantled during 1918, with nearly all of the metal components recycled for use during World War I (*Minnetonka Record* 1906; Olson 1976, 202-203, 205; Construction Records: Ledgers, TCRT Records 1905-1909, 509, 513, 515-517, 519). MHM's archaeologists, volunteers, and kid students conducted brief terrestrial archaeological investigations on Big Island in 2003 and 2007 (Merriman and Olson 2007) and uncovered *in situ* examples of the architecture that matches the components found in Anomaly 351. MHM filed a Minnesota archaeological site form with the OSA in December 2011 and obtained a number (21-HE-402) for the Big Island Steamboat Pier, Park, and Veterans Camp Site at that time. In December 2015, MHM submitted a site form update to the OSA for the site and extended its boundaries to include the rubble pile. If more piles are located in the future, MHM can extend the site boundaries again.



MHM's sonar image of the Submerged Rubble Pile from the Big Island Amusement Park (Anomaly 351).

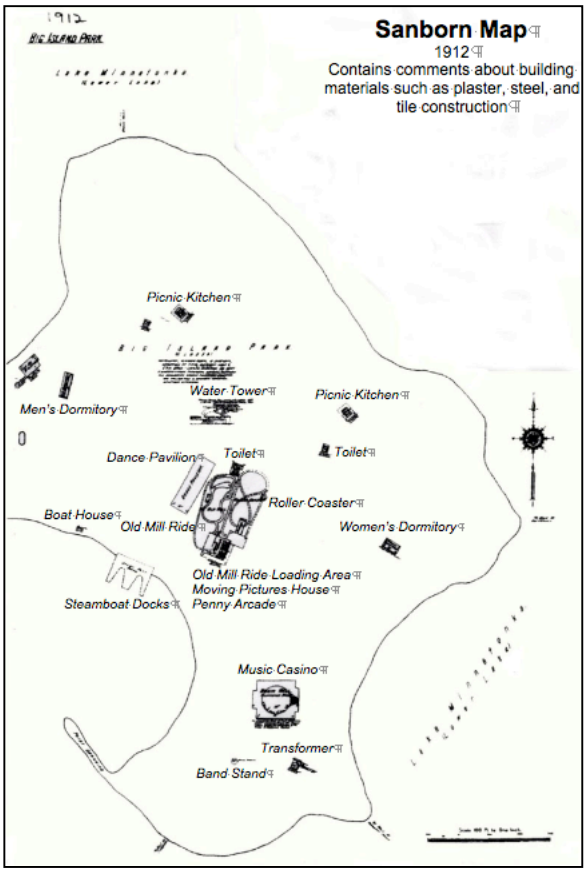
A view of the Rubble Pile from the dismantling of Big Island Amusement Park (Kelly Nehowig).

Another view of the Rubble Pile from the dismantling of Big Island (Kelly Nehowig).

The Rubble Pile contains sections of intact Mission style walls. Shown above in 2003, MHM's archaeologists excavated part of the wall surrounding the roller coaster on Big Island. This test trench reveals an in situ section of wall that matches the construction of the piece on the bottom of Lake Minnetonka (Left: Kelly Nehowig; Above: MHM).

One of the Big Island picnic pavilions constructed in the Mission style (MHM post card).

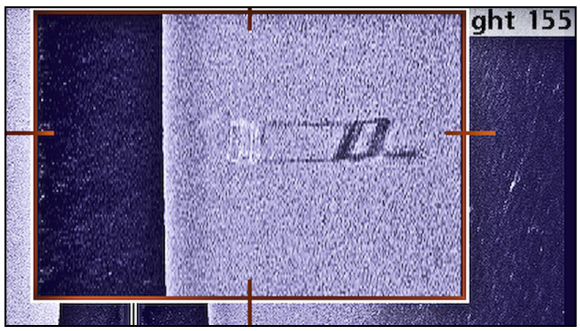
A metal valve and pipe standing up in the water column (Kelly Nehowig).



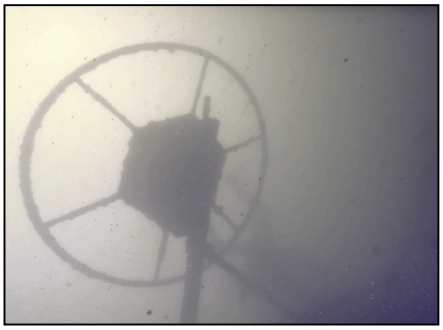
The 1912 Sanborn Insurance map of the Big Island Amusement Park, a year after it closed.

Boat Lift Frame Site (Anomaly 7)

MHM recorded a sonar image of the Boat Lift Frame Site (Anomaly 7) during the LMS-1 Project in November 2011 and in early September 2015 identified the site. The frame is 10.50 feet long by 9.00 feet wide, sits 7.60 feet off the lake bottom, and is constructed of steel. The lift's boat bunks are extant and it has a manually operated winch drive train to raise and lower a watercraft. The lifting wheel is located in the water column and is movable. Anomaly 7 does not have a canopy frame attached to it, but it may have had one when it was attached to a dock. It may have detached from a nearby dock during high winds or it may have been intentionally scuttled.

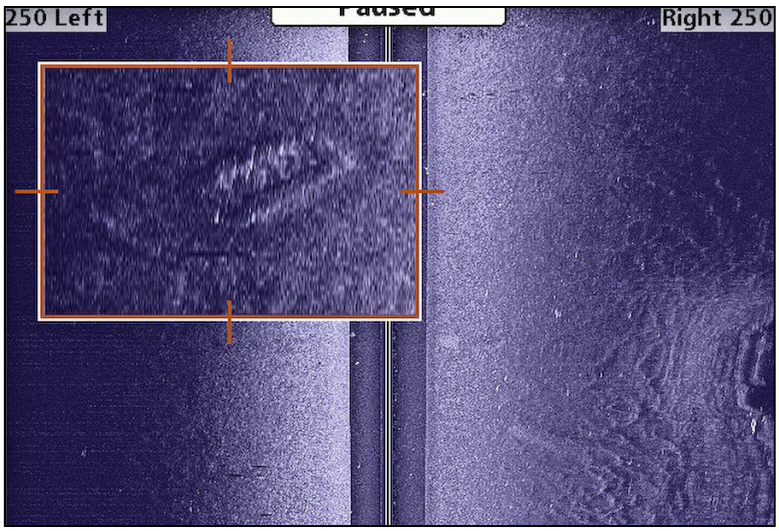


MHM's sonar image of Anomaly 7 and the Boat Lift's wheel (Mark Slick).



Peaked Boat Canopy Frame Site (Anomaly 97)

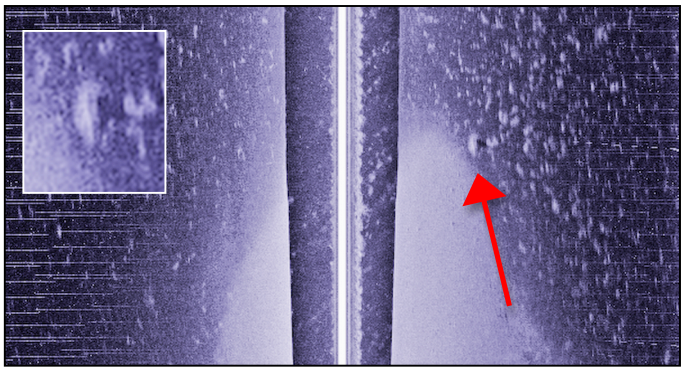
MHM recorded a sonar image of the Peaked Boat Canopy Frame Site (Anomaly 97) during the LMS-2 Project in May 2012 and in early October 2015 identified the site. The frame is about 22 feet long, it is upside down, the canopy is still attached and rises slightly off the lake bottom because of its peaked nature, and is constructed of steel. It may have detached from a nearby dock during high winds or it may have been intentionally scuttled. There is no boat lift mechanism evident. Anomaly 97 is located in an area of Lake Minnetonka with zero visibility, so the details about the site are vague and no photographs or video were possible.



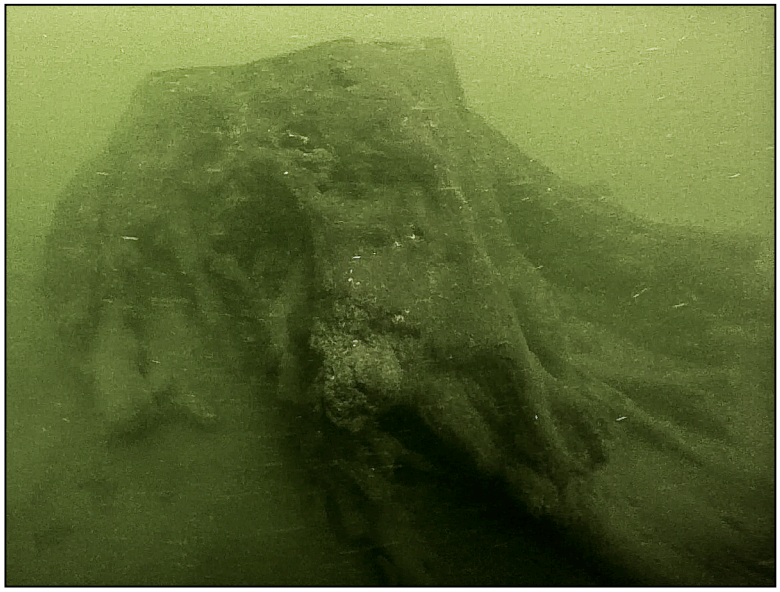
MHM's sonar image of the Peaked Boat Canopy Frame Site (Anomaly 97).

Cut Tree Stump (Anomaly 563)

MHM recorded a sonar image of Anomaly 563 in November 2011. The object appeared to be small, but cast a significant acoustical shadow. In mid-September 2015, MHM identified Anomaly 563 as a Cut Tree Stump, an object a left over from a cut tree that has been modified by humans, and is technically an artifact. The stump was either left on the ice or dumped from a barge into the middle of Wayzata Bay. Anomaly 563 is the second cut stump located in a bay and not along a shoreline; the first is Anomaly 13 in Browns Bay, identified during the LMNA-4 Project.



MHM's sonar image and inset of the Cut Tree Stump (Anomaly 563).



Anomaly 563, the Cut Tree Stump (Mark Slick).

Anomalies 441, 487, 494, 558/559

Sonar images of Anomalies 441, 487, 494, and 558/559 were recorded during the LMS-1 and LMS-2 Projects in 2011 and 2012. These three anomalies were identified during the LMNA-5 Project as cut logs or parts of unprocessed trees.

Anomalies 199, 449, 457, 491, 548, 549, 550

Sonar images of Anomalies 199, 449, 457, 491, 548, 549, and 550 were recorded during the LMS-1 and LMS-2 Projects in 2011 and 2012. Their sonar signatures suggested they might be human-made objects because they had substantial acoustical shadows and their shape suggest straight lines. After diving on these anomalies during the LMNA-5 Project, it has been determined that they are clumps of weeks in unexpectedly deep water and rocks.

Anomalies 40, 327, 337, 452, 481, 489, 552, 564, 566, 569

MHM recorded sonar images of Anomalies 40, 327, 337, 452, 481, 489, 552, 564, 566, and 569 during the LMS-1 and LMS-2 Projects. They were determined to be false targets during the LMNA-5 Project. The anomalies were contours on the lake bottom that suggested human-made objects.

Conclusion

The LMNA-5 Project produced interesting and significant results, particularly identifying 5 new wrecks and 3 new maritime sites on the bottom of Lake Minnetonka. These wrecks and sites join dozens of other submerged cultural resources already identified in the lake. Comparing and associating these new sites with known sites increases our understanding of the historical context within which these cultural resources operated or

were exploited by Minnesotans. Firstly, the Fisherman's Friend Wreck (21-HE-485) and the Maxwell Bay Rowboat Wreck 2 (Anomaly 78.1) are noteworthy because of their athwartships bottom planking and keel-less design, a construction method that required less skill to accomplish. Of the nine small wooden wrecks identified on the lake bottom (mentioned above) to date, these two wrecks are the only examples that reflect this construction attribute. The Maxwell Bay Rowboat Wreck 2 is also remarkable for its sharply-pointed and steeply-raked bow with its rub strake and composite stempost. These design attributes, put together, reflect a purpose-built vessel designed for shallow water travel and to withstand hard landings on rocky shores. For comparison, the Hopper Barge Wrecks (21-HE-441), two of the larger wooden wrecks in the lake, are also athwartships planked. These 2 large and sturdy work boats were constructed by master craftsman Captain John R. Johnson of Excelsior.[5] These four examples of athwartships planked vessels, two large and two small, were similarly constructed. However, the skill level needed to produce them was vastly different; the two small rowboats could have been constructed by a local boatworks or by an individual with minimal construction experience. The latter hypothesis is probable, at least in the case of the Maxwell Bay Rowboat Wreck 2.

The Wooden Sloop Wreck (21-HE-486) is the first sailboat wreck identified in Lake Minnetonka, although a wooden mast or sail boom (Anomaly 291.1) has been recognized. Dating to the late 19th or possibly early 20th Century, this clinker-built sloop is a precursor to the sleek racing sloops that are still seen today on the lake with fiberglass hulls, both with pointed and scow bows. The Wooden Sloop Wreck may have engaged in early regattas on Lake Minnetonka, events that occur regularly with the Minnetonka Yacht Club and Wayzata Yacht Club.

The *Doug Out* Utility Wreck (Anomaly 403), although she was apparently wrecked in mid-1959, leaves MHM with the most questions pertaining to her nature when compared to older sites; this is often the case with relatively modern Lake Minnetonka wrecks. While *Doug Out* has many attributes in common with other identified wrecks in the lake: Century Deluxe Utility Wreck (21-HE-423), Correct Craft Utility Wreck (21-HE-467), and the Correct Craft Aqua Skier Deluxe Wreck (21-HE-424). However, like the Damaged Bow Utility Wreck (21-HE-447),[6] her manufacturer and model cannot be determined without more hard data. One detail these four utility wrecks do not have in common with *Doug Out* is their wooden hulls. *Doug Out's* fiberglass faux lapstrake hull with a wooden deck is a rare attribute combination for an inboard boat of any vintage, and those that MHM could locate in historical documents had smooth hulls, not imitation clinker-built. Outboard fiberglass hulls with wooden decks were manufactured by a handful of boat companies from the late 1940s to the early 1960s and some of them were faux lapstrake design, but the inboard *Doug Out* cannot be any of these models. The fiberglass wrecks *Doug Out*, Owens Twin Sport Wreck (Anomaly 91), Span America Nomad Wreck (Anomaly 126.1), Blue Star Miamian Custom Wreck (21-HE-bn), Red Fiberglass Wreck (Anomaly 32), and Larson Delta Sport Cruiser Wreck (Anomaly

[5]See MHM's *Lake Minnetonka Nautical Archaeology 3 Project Report* for more information.

[6]See MHM's *Lake Minnetonka Nautical Archaeology 1 Project Report* and *Lake Minnetonka Nautical Archaeology 2 Project Report*, and *Lake Minnetonka Nautical Archaeology 3 Project Report* for more information.

464); the aluminum-hulled Alumacraft Center Console Model R Wreck (21-HE-448) and Alumacraft Model R Wreck (Anomaly 21.1);[7] and the four aforementioned wooden-hulled utility wrecks represent the post-World War II pleasure boat-owning boom that shaped Lake Minnetonka's pleasure boating culture throughout the latter half of the 20th Century. These boats were used for simple transportation (most were advertised as being able to go fast, fast, fast), water-skiing, and fishing.

The Fiberglass Drag Boat Wreck (Anomaly 23), while being contemporary with the Owens Twin Sport Wreck, Span American Nomad Wreck, Blue Star Miamian Custom Wreck, and Red Fiberglass Wreck, was produced for a different purpose when compared to these passenger craft. The Fiberglass Drag Boat Wreck's function dictated her design as a fast speed boat used for racing. Her long bow and forward deck made her front end light, her small cockpit limited the number of passengers she could carry, and the large V-8 engine had an excessive amount of power for a light 16.40 foot boat. The engine also made her stern-heavy when she sank; the stern hit bottom hard in soft silt and her bow remained in the water column. MHM hopes to return to Anomaly 23 to answer several questions, including the wreck's manufacturer and the make of the engine.

The Water Intake Pipe and Wooden Crib Site (Anomaly 9) represents a type of infrastructure that has allowed the permanent occupation of Lake Minnetonka, as well as supporting the operations of tourist destinations, marinas, restaurants, and other businesses. As the water conduit for the Minnetonka Beach Water Tower, Anomaly 9 and similar constructions allowed the required services necessary to sustain a large population in the lake's communities. MHM values this type of submerged maritime site since it reminds Minnesotans that a successful community often relied on unseen infrastructure that was designed and constructed by engineers and laborers who used their skills to support a population on Lake Minnetonka. The Big Island Rubble Pile (Anomaly 351) joins the Big Island Steamboat Pier, Park, and Veterans Camp Site (21-HE-402) and represents part of the early 20th Century economy that included an affordable day out to Lake Minnetonka for lower and middle-income Twin Cities residents.[8]

Other maritime sites identified during the LMNA-5 Project, the Boat Lift Site (Anomaly 7) and the Peaked Boat Canopy Site (Anomaly 97), represent dock structures that are used with boats. These dock accessories are not vital to the operation of boats on Lake Minnetonka, but they are aids to maintenance by protecting boats from continuous water and sun exposure. Lastly, even though the Cut Tree Stump (Anomaly 563) is just a cut stump, it is a submerged cultural resource since human beings modified it. Just like 'The Old Man of St. Albans Bay' (Anomaly 70)[9] is a cut log that was supposed to be a pier or dock piling, Anomaly 563 is part of the Lake Minnetonka's history that

[7]See MHM's *Lake Minnetonka Nautical Archaeology 1 Project Report*, *Lake Minnetonka Nautical Archaeology 2 Project Report*, *Lake Minnetonka Nautical Archaeology 3 Project Report*, and *Lake Minnetonka Nautical Archaeology 4 Project Report* for more information.

[8]See MHM's *Dig on This Archaeology Program Report* and *Lake Minnetonka Survey 1 Project Report* for more information.

[9]See MHM's *Lake Minnetonka Nautical Archaeology 4 Project Report* for more information.

represents the vast deforestation that occurred during the latter half of the 19th Century.

The second half of the 2015 Sediment Build-Up Study was a success; the first half of this year's study occurred during the LMNA-4 Project. Sediment data collected from 2013 to mid-2015 from wrecks in different sections of Upper and Lower Lake Minnetonka will be augmented with information accrued during the LMNA-5 Project. The sediment amounts measured inside the hulls of the Wooden Sloop Wreck, Maxwell Bay Rowboat Wreck 2, and *Doug Out* Utility Wreck, along with the lack of sediment collected around the Fisherman's Friend Wreck, are particularly helpful for determining the sinking dates of cultural resources based on sediment build-up rates - dependent on their exact location on the lake bottom.

The diversity of nautical, maritime, and underwater sites so far identified in Lake Minnetonka are tangible examples of the rich maritime history of the area. Through research, diving on wrecks and anomalies to collect pertinent data, and ensuring that the collected information is accessible by the public, MHM will continue to investigate Lake Minnetonka's submerged cultural resources into the future. MHM continually re-examines the recorded sonar footage from the LMS-1 and LMS-2 Projects, and spot re-scanning has occurred in different areas of the lake, using knowledge gained from the comparison of anomalies that have proven to be wrecks or other submerged cultural resources in past projects. Several hundred more anomalies have been identified from this on-going sonar review. The results of the LMNA-5 Project summarized above is connected to all the work that came before and that will come after its completion. It is clear that the types of sites that exist in Lake Minnetonka are diverse, archaeologically and historically significant, and worthy of great attention. To date, the watercraft located on the bottom of Lake Minnetonka represent nearly 1,000 years of Minnesota's maritime history and nautical archaeology. In the historic period, the known wrecks represented in the lake span 140 years of local maritime culture. The data collected during the LMNA-1, LMNA-2, LMNA-3, LMNA-4 and LMNA-5 Projects have been utilized to create the Lake Minnetonka Multiple Property Documentation Form, a guide that will be used to nominate Lake Minnetonka's submerged cultural resources to the National Register of Historic Places (NRHP). At this point, the Wayzata Bay Wreck (21-HE-401) has been nominated to the NRHP and is awaiting National Park Service approval.

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